

AMENDMENTS TO THE CLAIMS

Cancel claims 1-41 and 50-56 without prejudice.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-41. (Canceled)

42. (Currently amended) ~~The device of claim 41,~~

A device comprising:

a substrate having a plurality of solder bumps;

an integrated circuit die having a plurality of connection bumps each bonded to a respective one of the solder bumps; and

an underfill between the substrate and the integrated circuit die, the underfill being at least partially filled with filler particles, at least some of the filler particles being electrically conductive;

wherein the filler particles include non-conductive particles and conductive particles;

wherein the non-conductive particles do not exceed 50% by volume of the underfill and the conductive particles do not exceed 30% by volume of the underfill.

43. (original) The device of claim 42, wherein the non-conductive particles do not exceed 40% by volume of the underfill.

44. (original) The device of claim 43, wherein the non-conductive particles constitute at least 20% by volume of the underfill, and the conductive particles constitute at least 10% and not more than 20% by volume of the underfill.

45. (Currently amended) ~~The device of claim 41,~~

A device comprising:

a substrate having a plurality of solder bumps;

an integrated circuit die having a plurality of connection bumps each bonded to a
respective one of the solder bumps; and

an underfill between the substrate and the integrated circuit die, the underfill being at
least partially filled with filler particles, at least some of the filler particles being electrically
conductive;

wherein the filler particles include non-conductive particles and conductive particles;

wherein at least some of the non-conductive particles are substantially larger than all of
the conductive particles.

46. (original) The device of claim 45, wherein:

the non-conductive particles constitute at least 20% and not more than 40% by volume of
the underfill;

the conductive particles constitute at least 10% and not more than 20% by volume of the
underfill;

the non-conductive particles are formed of silica;

the conductive particles are formed of one of: (a) a tin-based solder, (b) silver and (c)
aluminum; and

the underfill includes diglycidylether of bisphenol F and methylhexahydrophthalic
anhydride.

47. (Currently amended) The device of claim 41 ~~41~~ 42, wherein:

the non-conductive particles include one or more of silica, alumina and boron nitride; and

the conductive particles include at least one of: copper, silver, aluminum, gold, platinum, palladium, beryllium, rhodium, nickel, cobalt, iron, molybdenum, tin, lead, chromium, zinc, magnesium, titanium, bismuth, cadmium, gallium, indium, mercury, antimony, scandium and polonium.

48. (original) The device of claim 47, wherein the conductive particles are formed of a metal alloy or a solder alloy.

49. (original) The device of claim 47, wherein:

the non-conductive particles are formed of silica; and

the conductive particles are formed of one of: a tin-based solder, silver and aluminum.

50-56. (Canceled)

57. (Currently amended) ~~The system of claim 56,~~

A system comprising:

a die comprising an integrated circuit; and

a chipset in communication with the integrated circuit;

wherein the die comprises a plurality of connection bumps each bonded to a respective one of a plurality of solder bumps on a substrate, an underfill being present between the substrate and the die, the underfill being at least partially filled with filler particles, at least some of the filler particles being electrically conductive;

wherein the filler particles include non-conductive particles and conductive particles;

wherein:

the non-conductive particles constitute at least 20% and not more than 40% by volume of the composition; and

the conductive particles constitute at least 10% and not more than 20% by volume of the composition.

58. (New) A device comprising:

a substrate having a plurality of bumps;

an die having a plurality of bumps each bonded to a respective one of the bumps of the substrate; and

an underfill between the substrate and the die, the underfill being at least partially filled with filler particles;

wherein the filler particles include non-conductive particles and conductive particles;

wherein the non-conductive particles do not exceed 50% by volume of the underfill and the conductive particles do not exceed 30% by volume of the underfill.

59. (New) The device of claim 58, wherein the non-conductive particles do not exceed 40% by volume of the underfill.

60. (New) The device of claim 59, wherein the non-conductive particles constitute at least 20% by volume of the underfill, and the conductive particles constitute at least 10% and not more than 20% by volume of the underfill.